

*Atty Docket: 2003-IP-010400 U1 (1391-43500)**Patent***Amendments to the specification:**

[0036] Figs. 7 and 8 provide cross sectional and perspective views of an alternative retainer cap 80 which may be used in place of the retainer cap 46 shown in Figs. 1 and 6. The alternative cap 80 provides more protection for the boot 44 of Figs. 4 and 5. An upper end 82 of the retainer cap 80 is essentially identical to the retainer cap 46. Retainer cap 80 has an inner threaded surface 84 on its upper end sized to mate with the threads 62 on the lower end of booster holder 28, Figs. 2 and 3. The lower end 86 of cap 80 is basically a hollow cylinder sized to fit over and completely cover the lower end 66 of the boot 44. Between the threaded portion 84 and the smaller diameter upper end 86 is a shoulder 88 adapted to engage the shoulder 68 on the boot 44, Figs. 4 and 5. An opening 90 on the lowermost end of the retainer cap 90 is sized to fit the detonating cord 42 of Fig. 1. It can be seen that if the alternative retainer cap 80 is substituted for the retainer cap 46 of Fig. 1, essentially the entire boot 44 is covered and protected by the retainer cap 80. The retainer cap 80 is particularly useful in wells in which the ambient conditions of pressure, temperature and gases, such as methane, may cause the boot 44 to swell or lose strength and ~~possible~~ possibly allow borehole fluids to flow between the detonating cord 42 and the boot 44. The retainer cap 80 maintains a close fit of the boot 44 to the detonating cord 42. If any swelling of boot 44 occurs, it will only increase the seal between the boot 44 and the cord 42, since the cap 80 is preferably made of metal which will maintain its dimensions. The retainer cap 80 may have a knurled outer surface to facilitate manual turning during the assembly process described below.

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[0040] Seals, e.g. O-ring seals, are then inserted into the grooves 58 on the upper end 30 of booster holder 28 and a lubricating and preferably water sealing material, such as petroleum or silicone grease, is preferably applied to the seals. The upper end 30 of booster holder 28 is then slid over the exposed lower end of the detonator 16 until the upper end 30 seats in the lower end of chamber 14 in firing head 10. At this point, the lower end of the detonator 16 should be adjacent the upper surface of the bulkhead 38. The retaining clip ~~40~~ 48 is then inserted into the groove 60 in booster holder 28 and attached to the firing head 10 with screw 50.